IN THE CLAIMS:

The following Listing of Claims replaces all prior versions and listings of claims in this application.

Listing of Claims

1. (Currently amended) A signal processing apparatus comprising:

a demodulator arranged to demodulate a received signal, which carries consecutive symbols at a symbol rate, wherein the demodulator is arranged, based on sample values of the received signal, to calculate an error value of a given symbol relative to a decision-directed determination of an expected symbol value; and

a phase-shifter arranged to shift a phase of sampling points in time at which points in time, sample values of the received signal are provided to the demodulator; and

a processor arranged to evaluate an error metric, at the symbol rate, for a given symbol as a function of the error value and symbol values, and to determine whether to shift the phase of the sampling points in time based on further evaluation of the error metric;

wherein either the error metric is at least one of a function of the phase error value of a given symbol relative to the decision-directed determination of an expected symbol phase value, the phase value of a previous symbol, and the phase of a succeeding symbol; and a function of the phase error of the received symbol multiplied by a difference between the phase of a previous symbol and the phase of a succeeding symbol; or

the error metric includes a first term representing that the sampling phase is advanced in time and a second term representing that the sampling phase is delayed in time relative to an optimal sampling phase, wherein the first term is the phase error of the received symbol multiplied by the phase of a succeeding symbol, and the second term is the phase error of the received symbol multiplied by the phase of a preceding symbol; or

the error metric expresses Inter Symbol Interference based on an estimate, which is based on an estimated impulse response for a transmission channel over which the symbol is transmitted prior to being input to the signal processing apparatus.

2. (Previously presented) A signal processing apparatus according to claim 1, wherein the error metric is a function of symbol values for symbols preceding and succeeding the given symbol.

3. (Previously presented) A signal processing apparatus according to claim 1, wherein the error metric is a function of expected symbol values.

4. (Previously presented) A signal processing apparatus according to claim 1, wherein the demodulator is configured as a Phase Shift Keying (PSK) demodulator or a Differential Phase Shift Keying (DPSK) demodulator.

5.-8. (Canceled)

9. (Previously presented) A signal processing apparatus according to claim 1, wherein the demodulator is arranged to calculate a variable for time tracking based on an accumulated sum of the error metric.

10. (Previously presented) A signal processing apparatus according to claim 9, wherein the processor is arranged to determine whether to shift the phase, based on the accumulated sum of the error metric.

11. (Canceled)

12. (Previously presented) A signal processing apparatus according to claim 1, wherein the apparatus comprises a sampler arranged to sample the signal at an over sampling ratio OSR, which provides OSR samples per symbol; and the phase-shifter is arranged to control which out of every N samples is to be provided to the demodulator.

13. (Previously presented) A signal processing apparatus according to claim 1, wherein the demodulator is arranged to calculate the error value of a given symbol additionally, relative to a reference value and the reference value is calculated, based on a calculated error value of previously received symbols.

14. (Previously presented) A mobile telephone comprising a signal processing apparatus as set forth in claim 1.

15. (Currently amended) A method of processing a signal, comprising the steps of:

demodulating a received signal, which carries consecutive symbols at a symbol rate, and

based on sample values of the received signal, calculating an error value of a given symbol relative to a decision-directed determination of an expected symbol value; and

shifting the phase of sampling points in time; and

evaluating an error metric, at the symbol rate, for a given symbol as a function of the error value and symbol values, and

determining whether to shift the phase of the sampling points in time based on further evaluation of the error metric;

wherein the error metric is at least one of a function of the phase error value of a given symbol relative to the decision-directed determination of an expected symbol phase value, the phase value of a previous symbol, and the phase of a succeeding symbol; and a function of the phase error of the received symbol multiplied by a difference between the phase of a previous symbol and the phase of a succeeding symbol; or

the error metric includes a first term representing that the sampling phase is advanced in time and a second term representing that the sampling phase is delayed in time relative to an optimal sampling phase, wherein the first term is the phase error of the received symbol multiplied by the phase of a succeeding symbol, and the second term is the phase error of the received symbol multiplied by the phase of a preceding symbol; or

the error metric expresses Inter Symbol Interference based on an estimate, which is based on an estimated impulse response for a transmission channel over which the symbol is transmitted prior to being input to the signal processing apparatus.

16. (Previously presented) A method of processing a signal according to claim 15, wherein the error metric is a function of symbol values for symbols preceding and succeeding the given symbol.

17. (Previously presented) A method of processing a signal according to claim 15, wherein the error metric is a function of expected symbol values.

18. (Previously presented) A method of processing a signal according to claim 15, wherein the demodulation is Phase Shift Keying (PSK) demodulation or Differential Phase Shift Keying (DPSK) demodulation.

19.-22. (Canceled)

23. (Previously presented) A method of processing a signal according to claim 15, wherein the demodulation comprises calculation of a variable for time tracking based on an accumulated sum of the error metric.

24. (Previously presented) A method of processing a signal according to claim 23, wherein the evaluation comprises determination of whether to shift the phase, based on the variable for time tracking.

25. (Canceled)

26. (Previously presented) A method of processing a signal according to claim 15, further comprising the step of sampling the signal at an over sampling ratio OSR, which provides OSR samples per symbol; and the step of shifting the phase involves controlling which out of every N samples is to be provided for demodulation.

27. (Previously presented) A method of processing a signal according to claim 15, wherein the demodulating includes calculating the error value of a given symbol relative to a reference value, and the reference value is calculated, based on a calculated error value of previously received symbols.